TRANSBOUNDARY GAS GROUP MEETING NOTES

DOUGLAS COUNTY PUD OFFICES
WENATCHEE, WASHINGTON

April 9-10, 2002

Day 1: April 9, 2002

1.0 Greetings and Introductions.

Transboundary Gas Group co-chairs Mark Schneider and Les Swain, as well as host Rick Klinge of Douglas County PUD, welcomed everyone to the meeting, then led a round of introductions. Please note that some of the enclosures referenced in these meeting notes may be too lengthy to routinely attach to the minutes; please contact Kathy Ceballos at (503/230-5420), or kathy.ceballos@noaa.gov, to obtain copies.

2.0 Ecology Letter to EPA (February 21, 2001).

This has to do with a letter that was sent by the Washington Department of Ecology to the U.S. EPA in February, said Schneider; he distributed copies of the letter (Enclosure C). Essentially, the letter requests that EPA take a lead role in coordinating activities to abate gas coming over the border, he explained. I've talked with Megan White at WDOE about the TGG's ability to offer assistance on the coordination of activities aimed at dissolved gas coming over the border and into Lake Roosevelt, Schneider said; I told her this group would be able to serve as a source of information on the gassing effects of each of the projects that are sources of gas for Lake Roosevelt. I hope you'll agree this is something this group can do, and do fairly quickly, Schneider said.

Chris Maynard explained that this letter was sent basically as a heads-up for EPA under the new administration. It also lays out a vision of an ombudsman who might be able to deal with these issues in more detail than the TGG can probably do. Not mentioning the TGG in the letter was an oversight, he said. Has EPA responded? asked one participant. No, Maynard replied.

My suggestion to Megan was that we develop an inventory of the relevant projects, as well as a summary of the known information about the gassing effects of those projects, Schneider said – it could be nothing more than a letter with a table attached. The group devoted a few minutes of discussion to potential sources of data to accompany the TGG's letter. One participant noted that this is a much more complicated question than Schneider may have anticipated, given the variability in yearly hydrologic conditions and daily and hourly project operations. There is so much data, another participant observed – can we boil it down to a set of

key, useful information items?

Ultimately, it was suggested that the TGG designate a small subgroup to work with WDOE to develop a clearer idea of the type of information and the format that would be most useful. There was general agreement that this would be a more efficient approach than trying to develop those parameters at this meeting. Essentially what this points out is a need for better modeling, another participant observed. After a few minutes of discussion, Schneider said he will contact the appropriate TGG participants and coordinate the subgroup's interaction on this item. We'll go to WDOE and EPA simultaneously, offering to be an information source for both agencies, subject to receiving better information about the type of data they need, Schneider suggested. It was so agreed.

3.0 Dissolved Gas Monitoring.

3.1 Update on 2002-2003 Work Plans by Jurisdiction.

3.1.1 Data Quality Criteria for Fixed Monitoring Stations.

Dick Cassidy and Laura Hamilton briefed the group on the Corps of Engineers' monitoring plans for 2002. They worked from two Powerpoint presentations, copies of which are available upon request from Cassidy. The first presentation was titled "Database Standards for a Regional Distributed System;" some of the key points included:

- The relevant Biological Opinion RPA
- Existing documents calling for regional database standards
- Reasons for database standards (easier to query with various softwares, easier to perform comparisons and analyses, greater user-friendliness, standardized data minimizes confusion, standardized data saves time by promoting fewer telephone calls and questions, standardized data makes it easier to sport areas, and promotes the use of others' macros, standardized data is easier to defend in legal actions, standardized data makes it easier to spot anomalies, standardized data makes it easier to link databases)
- Proposals (1. I request that the process to establish regional standards begin immediately, 2. I request that the data quality criteria that Dick and I presented become the regional protocols for fixed monitoring stations, 3. You are invited to join BPA and COE in our efforts to select a water quality database)

Next, Cassidy provided a presentation titled "Data Quality Criteria for Fixed Monitoring Stations" (Enclosure D). Among the key points of this presentation:

- Three parts of the data quality criteria (1. Calibration protocols, 2. Reviewing data quality, 3. Completeness of data
- Lab calibration protocols
- Primary and secondary standards

- Field Calibration protocols
- Typical data from FMS
- Data flow
- Reviewing the data
- Checklist for checking data
- Graphs for checking data
- Dealing with suspect data
- Completeness tables – FY 2000, FY 2001
- Data completeness goal and calculation
- USGS reports (websites for obtaining USGS reports: http://oregon.usgs.gov/projs_dir/pn307.tdg/pn307.html.

Please refer to Enclosure D for details of Cassidy's presentation.

The group devoted a few minutes of discussion to Cassidy's presentation, offering a variety of clarifying questions and suggestions. Much of this discussion had to do with the degree to which currently-available water quality data is or is not corrected or "cleaned up." The group also discussed the Corps' current instrument calibration protocols.

Cassidy noted that his goal today was both to share information and to encourage a larger regional audience to participate in the data quality criteria and database selection processes, to ensure that whatever criteria and database are chosen enjoy broad regional acceptance. He added that the NMFS Forum Water Quality Team will soon be creating a subcommittee to work on this issue.

3.1.2 CRIEMP Update. Andrea Ryan briefly updated the group about CRIEMP dissolved gas monitoring on the Canadian side of the border. There isn't a lot to report, she said; the Waneta station has been in and out of service due to power surges. Keenelyside does have some monitoring planned, she said; there is also a proposal for CRIEMP 2 on the table, looking at a variety of biological parameters. We're going through the planning process for that at the moment, she said; in all likelihood, it will include some dissolved gas monitoring.

3.1.3 Other Updates. Waikele Hampton of Chelan County PUD said there is nothing different from last year; there will still be a probe in the forebay and tailrace at Wells, Rocky Reach and Rock Island. The Waterways Experiment Station is also doing a study of gas characteristics at Rocky Reach which might be a step toward investigating abatement at that project. It was noted that a near-field study is planned at Rocky Reach and Priest Rapids Dam; that study has already been completed at Rock Island and Wanapum. It sounds, then, as though, after this year, we should have a pretty complete picture of near-field effects at four of the five Mid-Columbia projects (Wells being the exception), Schneider said.

3.2 Development of a U.S. CRIEMP-Type Forum.

Schneider noted that EPA's Chuck Rice was not able to attend today's meeting; however,

he sent a fax outlining the recent activities of the subgroup set up to address this issue at the TGG's October 2001 meeting:

> "During the October 2001 TGG meeting in Castlegar, the group recommended that the effort to develop a more structured working arrangement among U.S. hydropower owner/operators should continue. Further, the group recommended that the current lead continue in that role. The objective was to work toward the establishment of a process and means to pool resources for completing tasks of the TGG (e.g. those outlined in the framework plan).
>
> "Subsequent to that October meeting, two conference calls were held with volunteer representatives from the TGG. The concept at issue was outlined in a straw document with a revision date of October 18, 2001.
>
> "The first of these conference calls was held on December 18, 2001, during which legal counsel for the U.S. Army Corps of Engineers discussed some potential problems with the development of an MOA in the form, and with the content, under consideration. In addition, other difficulties with the concept were aired and discussed, including whether such a forum would be better situated under the TMT.
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> "On January 17, 2002, the discussion continued with a shift in focus: should the committee continue to explore development of this more formalized cooperative working arrangement for implementation of the action items of the TGG?
>
> "It was reported that using the existing TMT had been considered and rejected as an alternative forum. After more difficulties with the concept were brought forward, the participants questioned whether a need existed and whether work on the concept should continue. The participants then recommended that work on this project be suspended until additional interest is expressed."

3.3 Summary of Six Years of In-River Biological Monitoring for Gas in U.S.

Next up was Margaret Filardo of the Fish Passage Center, who provided a presentation titled "Biological Monitoring for Effects of Dissolved Gas on Juvenile Salmonids, 1994-2001." The presentation began with photographs of spill at Lower Granite and Priest Rapids Dams; Filardo noted that, in the 1970s, spill occurred because of excess capacity, a situation that ended with the development of the AC Interties in the 1980s. Among the other main points of this presentation (copies of which are available by calling Filardo directly at 503/230-4286) included:

- Total spill in the Snake and Lower Columbia Rivers, 1974-2001
- Sources of juvenile mortality (turbine, gas, spill, bypass)
- Risk-based management of TDG (establish objective for spill program, develop protocol and criteria for monitoring, implementation of program

- Mortality from available shallow-water studies
- Mortality from available deep-water studies
- Biological monitoring criteria
- Elements of the monitoring program
- Biological criteria – laboratory studies reviewed
- Biological monitoring criteria (review of information lead to use of external signs of GBT, in terms of prevalence and severity, incidence: 15% of fish with signs, severity: 5% with severe signs)
- Smolt monitoring sites
- The mechanics of fish collection
- Sample juvenile salmonid monitoring results
- A summary of GBT monitoring exceedences, by year
- The percent of yearling chinook, steelhead and subyearling chinook with fin GBT by severity rank
- Summary : the monitoring program has been consistently implemented, and QA/QC conducted. TDGS<115%/120%, few signs of GBT found in migrating juveniles. Above that level, the incidence and severity of those signs begins to increase
- Conclusions: Monitoring can be conducted for signs of GBT and can serve as a fail-safe program for the physical monitoring of TDGS. However, when signs begin to increase, the hydrosystem is in an uncontrolled spill situation and no management actions are possible. The original criteria used as the objective are likely well within the acceptable risk considered.

Dan Miller observed that it seems difficult to defend the 110% standard, given the fact that 120% TDG seems to pose little threat to migrating salmonids, and given the cost of the TDG abatement measures to achieve the 110% standard. Filardo replied that the standard is intended to protect not only juvenile salmonids, but the ecosystem as a whole. Still, said Miller, you're not factoring in the whole picture, including societal values. The other thing to keep in mind is that these are endangered species, Filardo said – a 2% risk of severe signs at 120% may seem acceptable on its surface, but bear in mind that that is not a measurement of total mortality. To me, as a biologist, protecting fish is the price you pay for operating a hydrosystem, she said.

Filardo said she will make the full text of her presentation available on the Fish Passage Center homepage; in-season fish passage data and the FPC's annual reports are also available via this website, www.fpc.org.

3.4 Canadian Studies on Dissolved Gas Biological Effects.

Les Swain led this discussion, beginning by distributing Enclosure F, an abstract from a Department of Fisheries and Oceans report titled "Effect of Dissolved Gas Supersaturation on the Survival and Condition of Juvenile Rainbow Trout Under Static and Dynamic Exposure Scenarios." He spent a few minutes going through its contents, noting, among other things, that what the study shows is an inverse dose-response relationship between TGP levels and the duration of exposure required to kill fish. Time to 50% mortality was 5.1 hours at 140%; at

122%, 55 hours. Please refer to Enclosure E for further details of Swain's remarks; he said he will furnish the full text of the report to Schneider for distribution to the TGG membership.

Swain then distributed an abstract from a second Fisheries and Oceans Canada study, "Susceptibility of Rainbow Trout and Coho Fry to Swim Bladder Overinflation Due to Dissolved Gas Supersaturation and Temperature, and Ecological Implications." Essentially, he said, this is just some additional biological information to inform your thinking and discussions.

4.0 Dissolved Gas Data and Modeling.

4.1 Update on Canadian Data, Database and Modeling.

Swain distributed a document titled "Total Dissolved Gas Pressure Database for the Columbia, Kootenay and Pend Oreille Rivers (Canada)" (Enclosure G). Just to give you a status report, he said, this is the database we've been developing for CRIEMP; it is now complete and has been submitted for use. He explained that the database covers the period 1995-2000, then drew the group's attention to the three tables at the end of this document, which detail the specific data sets, by project, included in the database. That's basically all I wanted to say, Swain said; you've heard about this many times in the past, and copies of the database are now available.

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4.4 Data for Pend Oreille Facilities U/S of Border.

Alan Solonsky of Seattle City Light provided a presentation titled "TDG Investigations at Boundary Dam" on the Pend Oreille River in northeastern Washington. He began with an overall project description, then moved on to a series of overheads. Among the highlights:

- TDG percentages below Boundary in the spring of 1998 (TDG ranged from 126%-144%, at the same flow, depending on how the sluice gates were used)
- The location of the forebay and tailrace monitoring stations
- Boundary generation in the first week of March, 2002
- Boundary operation during one day in March
- Air admission testing on Boundary Units 55 and 56 (not surprisingly, at lower levels of generation during peaking operations, more air is pulled into the units; when the units are operating at peak efficiency, less air is admitted)
- Boundary forebay and tailrace TDG, November 2001-March 2002 (up to 125% some days until the operational fix was implemented – bring Units 55 and 56 up through their inefficient operating range as quickly as possible)

Solonsky noted that, since this operational change was implemented, peak TDG in the Boundary tailrace has dropped from 125%+ to about 110%. It's good to know that you can have

a major impact on TDG production through simple operational changes, he said; all it's cost us is some grief to our dispatchers.

On the Canadian side of the Pend Oreille, John Richie gave a presentation titled "Waneta Dam – Modeling of TGP Generation: Effects of Waneta Upgrade Project." The first part of this presentation is to show the results of some modeling conducted by RL&L on the rate of entrainment of gas on the Pend Oreille, the Kootenay and the Columbia, he said, noting that Dana Schmidt did most of this work.

Richie noted that the environmental benefits of the Waneta upgrade include TGP reduction and greenhouse gas offsets; there are few negative impacts. Working from a series of overheads, he touched on the following major points:

- Project description (powerhouse capacity is currently 26.2 Kcfs; the upgrade will add about 3 Kcfs in capacity)
- The gas production relationships between Waneta, 7-Mile, Boundary, Keenleyside and Brilliant
- The study outline, with results expressed in terms of days of exceedence of 110%, 115% and 120% TDG at the border given various Waneta configurations. What the study shows is a small reduction in the number of days of exceedence through the Waneta upgrades; the best possible configuration and operational alternative (Brilliant expansion project+ zero spill at Waneta), the days of 120% TGP exceedance would drop from 20 to 11.

What this means, essentially, is that the majority of the gas entrainment in this reach occurs at Waneta, Richie said. The study conclusions include the following:

- Some reduction in TGP at the Canada/U.S. border can be attributed to the Waneta upgrade project
- Overall, the Brilliant expansion project has a greater predicted effect on TGP levels
- Limited further benefit is attainable at Waneta from further spill reduction – either Waneta expansion or physical spillway modifications.

Richie also discussed the recent spillway review at Waneta. He described the spillway configuration and physics of normal spillway operations, as well as Waneta tailrace bathymetry; the bottom line, said Richie, is that, in order to avoid plunging, we now use Bays 1, 2 and 3 first, because they entrain less gas than Bays 4, 5 and 6. There has been some discussion of raising the lip in Bays 4, 5 and 6 to provide more of a skimming, rather than a plunging, flow from those bays, Richie said; this project has been estimated to cost $6.3 million, plus a significant amount for design studies. The likely outcome of this project is successful operation over a narrow flow range; however, the benefit potential is limited, and the Waneta expansion is preferable.

Bill Duncan said it would be helpful if the TGG would be willing to write a letter endorsing the completion of the full Waneta expansion project, including the fourth unit.

Margaret Trenn briefly described her efforts to assess TGP data from the four dams above Brilliant. Our assessment is that, on a system basis, we aren't adding significant amounts of TGP at our four projects, she said. In response to a question from Schneider, Trenn said spill occurs only very rarely at the four projects.

Next, Bill Freeman from Columbia Power Co. provided a brief presentation on the Brilliant expansion project. He noted that, two years ago, the TGG provided a letter of support for the Brilliant Expansion project, which at that time, was only a gleam in Columbia Power's eye. It was a remarkable letter, Freeman said, endorsed as it was by nine state and federal agencies and the Spokane Tribe; it was sent to the president of Columbia Power. Freeman read an excerpt from the letter, then updated the group on the current status of the Brilliant expansion project. He described the planned expansion project, then moved on to the expected environmental benefits of the project (significant greenhouse gas offset, terrestrial/aquatic habitat creation, fish habitat availability, dissolved gas reduction). Freeman touched on the expected reduction in the number of days of 110%-115%-120% exceedence at the border once the Brilliant expansion project is completed (from 146-88-40 to 88-44-22).

Freeman noted that Peter Kiewit Sons of Omaha and the Brilliant Expansion Consortium are putting together bid packages that will be evaluated by Columbia Power beginning in July. In September, the company will announce its decision about which contractor has submitted the successful bid. To summarize, said Freeman, we really appreciated the TGG's letter; if the decision is made to construct a larger power plant than we originally envisioned in the expansion project, we may ask you to write another one.

Kent Dodie of Duke Engineering updated the group on activities at Box Canyon Dam on the Pend Oreille. He described the current project configuration, with 27 Kcfs in current powerhouse capacity. We will be monitoring both upstream and downstream of the project, he said; as long as flows are below 27 Kcfs, the project does not contribute to the TDG load in the river. When flow exceeds 40 Kcfs, we've seen consistent TDG levels of 135% in the tailrace, with spikes up to 145%, Dodie said. Obviously we try to avoid spill, he said; however, flows can exceed 80 Kcfs at the project during high-flow years. Dodie noted that the project is currently undergoing FERC relicensing; as part of that process, the project owners are proposing to upgrade powerhouse capacity to 36 Kcfs over the first five years of the license. That upgrade is expected to reduce the time the project would have to spill to only 8%. FERC has also asked the PUD to investigate additional dissolved gas abatement options, including passing water underneath the sluice gates; flip lips, or a bypass system that would essentially eliminate the need for spill.

Next, Jeff Laufle from the Corps of Engineers described his agencies' implementation of VARQ at Libby, Hungry Horse and Grand Coulee; the Corps is in the process of conducting an environmental impact statement on VARQ, as called for in the recent Fish and Wildlife Service Biological Opinion. Essentially, VARQ allows us to take advantage of the flexibility that exists in low- to medium-flow years to draft the reservoirs less, in order to save more water for later use in flow augmentation, Laufle explained; in high-flow years, the reservoir operation would

not change. The main impact will occur in medium-flow years, he said.

Luafle described the EIS process, noting that it is expected to be complete in 2004, with VARQ implementation to follow in 2005. The main concern is the increased risk of spill at Libby, he said. Laufle added, however, that the Bureau of Reclamation is implementing VARQ at Libby and Hungry Horse this year. Laufle also described the Corps' planned Libby spill test later this spring. He noted that more detailed information, including the spill Environmental Impact Statement and the various documents associated with the VARQ EIS, are available via the Corps' Seattle District website. The web address for VARQ is http://www.nws.usace.army.mil/ers/varq_web.htm. The web address to access the draft Environmental Assessment for the planned Libby spill test is http://www.nws.usace.army.mil/ers/reposit/ACF1C.pdf.

Laufle distributed copies of the purpose and need statement from the VARQ EIS (Enclosure I); he asked anyone with further questions about VARQ implementation to contact him directly (his email address is jeffrey.c.laufle@usace.army.mil).

The group discussed the potential impacts of VARQ on Kootenai Lake elevations and on the Canadian projects; it was reiterated that VARQ will have a significant impact on Kootenai Lake elevations only during medium-volume runoff years, perhaps one year in three.

Next up was Marian Valentine, also of the Corps' Seattle District. She distributed copies of the Libby spill test plan of study (Enclosure J), then moved on to the TDG situation at Albeni Falls Dam. Valentine noted that Albeni Falls adds very little gas to the system; it spills only rarely, and even at 45 Kcfs spill, the gas below the project is less than 115%. A further spill test is planned at Albeni Falls for next year.

5.3 Structural and Operational Alternatives at Chief Joseph and Grand Coulee.

Valentine led this presentation, using a series of overheads. She touched on the following major topic areas:

- Current project configuration (tall spillway, major gasser)
- TDG data from the project tailrace
- Spill volume and number of days, 1990-1997 (Chief Joseph does not spill often)
- The Chief Joseph flow deflector final design
- A description of the Chief Joseph/Grand Coulee spill exchange operation, which moves all spill to Chief Joseph
- The TDG output of Grand Coulee under the modeled alternatives (the number of days of exceedence of 120% would fall from 50% of the time to 10% of the time if spill is shifted from Grand Coulee to Chief Joseph)
- The TDG output of Chief Joseph Dam under the modeled alternatives (if flow deflectors are installed, TDG would never exceed 120% in the Chief Joseph tailrace)
- Downstream TDG benefits with deflectors and the operational change

Given these potential environmental benefits, why hasn't the Corps begun flow deflector construction? Valentine asked. The Corps has requested funding for the Chief Joseph flow deflector project, but the President's budget has not included it so far, she explained – there is currently a federal prohibition against new-start projects of this type. Congress can add funding for this project to their appropriation, she said, but as a federal agency, we are not allowed to lobby for specific projects. She noted that there is strong regional support for this project; hopefully, other entities in the region will exert enough Congressional influence to get the project funded. In response to a question, Valentine said the total cost of Chief Joseph flow deflectors is expected to be about $30 million.

6.0 Total Maximum Daily Load Update.

Paul Pickett distributed copies of the just-released draft Lower Columbia River Total Dissolved Gas Total Maximum Daily Load (TMDL); he began by explaining that the TMDL is essentially a plan for meeting the federal water quality standards. Part of the challenge with this TMDL is simply coming up with a document that makes sense, Pickett said; in many ways, the Lower Columbia TMDL is a square peg in a round hole – it doesn't really fit with the traditional TMDL process.

He described the geographic scope of this TMDL (the Snake/Columbia confluence down to the mouth of the Columbia), noting that the formal public comment period on this document has now ended. We will go through the comments received, incorporate them into the TMDL and produce a final draft for submission to EPA some time in May, Pickett said.

Pickett touched briefly on the status of the Snake River TDG TMDL, noting that the development of this TMDL is proceeding steadily. He said one of the key challenges that needs to be overcome is the occasional conflict between the Clean Water Act and the Endangered Species Act, particularly in the area of spill – the ESA calls for spill because it increases in-river survival, he said, but spill, of course, is what causes the elevated TDG levels that conflict with Clean Water Act requirements. Pickett also touched on the status of the ongoing Lake Roosevelt TMDL, noting that the Washington Department of Ecology, with tribal assistance, is in the process of collecting all of the available data and identifying data gaps. He added that WDOE has not yet selected a model to inform this analysis.

The group devoted a few minutes of discussion to modeling and data, offering a variety of clarifying questions and suggestions. Some of this discussion focused on the information and modeling tools available from the Canadian side of the border, particularly the Fiddler model. Ultimately, Pickett said he will contact the appropriate Canadian entities directly to exchange information about Lake Roosevelt that may be useful in developing the Lake Roosevelt TMDL. Sheryl Sears of the Colville Confederated Tribes noted that she would be reluctant to see WDOE use any existing modeling tool to develop the Lake Roosevelt TDG TMDL; Lake Roosevelt isn't like any other project in the system, she said. True enough, Pickett replied. He asked anyone with additional questions to contact him directly at 360/407-6882.

Next, Rick Parkin led a presentation on the development of the water temperature TMDL. He touched on the following major topic areas:

- The purpose of this presentation
- The purpose of the TMDL
- The applicable water quality standards
- How target temperatures are determined
- Columbia River target temperatures for the Canadian Border to Grand Coulee, Grand Coulee to Chief Joseph, Chief Joseph to Priest Rapids, Priest Rapids to the Oregon/Washington border, and the OR/WA border to the mouth
- A description of "site potential temperature" and how it is developed
- The site potential temperatures at each target site
- Target temperatures and how they will be calculated
- TMDL implications: essentially, this TMDL is based on site potential in the mainstems; water flowing into the TMDL from tributaries and boundary conditions... (there was a lot more)

The group devoted a few minutes of discussion to what information may be available from the Canadian side of the border; Swain noted that the study he referenced yesterday also includes water temperature data.

7.0 Other Business

7.1 TGG Project/Task Review.

Swain noted that there were four main tasks in the original framework plan; Task 4, regarding treaty interactions, is now complete. I would say that, in the next three to six months, we should consider passing along the Canadian database to our American cohorts, then proceed with a serious discussion of modeling needs, he said. Swain noted that, once the Brilliant and Waneta upgrades are complete, there won't be a lot more that can be done, in terms of improvements, in the area near the boundary; those improvements will need to come from upstream. Really, Swain said, I think the work the Transboundary Gas Group set out to do is largely done.

7.2 Total Dissolved Gas Credit Trading.

Jim Irish of BPA distributed a document, titled "Grand Coulee and Chief Joseph Dam Joint Operations – Gas Abatement Analysis" dated June 2001 (Enclosure K). He noted that an SCT subcommittee was formed to study this issue; it was chaired by BPA and included representatives from Reclamation, the Corps, the Northwest Power Planning Council and NMFS. Irish went briefly through the contents of this document, noting that it is the subcommittee's final report. He said the report leads into a discussion of potential dissolved gas credit trading among the Canadian projects as well as Chief Joseph/Grand Coulee. The conclusions of the report include the following:

- The joint operation of Grand Coulee and Chief Joseph for gas abatement appears to have significant benefit in eliminating the likelihood of spill at Grand Coulee with flows less than 7Q10 flows. The various scenarios listed above suggest the actual percent chance of exceeding a given spill value at Grand Coulee is dependent upon the assumed effective powerhouse capability as a percentage of maximum flow. Any circumstance that reduces the amount of generation at Grand Coulee increases the likelihood of spill at Grand Coulee. However, should any of the assumptions used to formulate this report change (positive or negative), then the conclusion may also change.
- Spill at Chief Joseph is less sensitive to the assumed effective powerhouse capability of maximum flow at Grand Coulee when discharges are equal to or less than 7Q10, but remain moderately sensitive at 7Q10 when Chief Joseph spill exceeds 133 Kcfs.
- The subcommittee also felt that the range of the assumed effective Grand Coulee plant capacity (235 Kcfs-258 Kcfs) is realistic and reasonable.
- Based on the results of this study, it is the subcommittee's conclusion that for flow up to the 7Q10 value, the risk of spill at Grand Coulee could be effectively eliminated by joint operations between the two projects (Grand Coulee and Chief Joseph), involving the shifting of power generation to Grand Coulee and spill to Chief Joseph.

Next, Bill Duncan on COMINCO described the current credit trading situation in Canada; he noted that, while he supports the credit trading concept, due to the current economic situation, it simply doesn't pencil out for COMINCO at this time. Duncan distributed two documents, "Using TGP Permit Trading to Manage Total Gas Pressure on the Columbia River" (Enclosure L) and "TDG Credit Trading: Update on Activities" (Enclosure M). Shari Dunlop said her company would like to have a more detailed discussion of the costs and benefits associated with this issue. Is there enough interest to form a TGG subcommittee to discuss this issue in more detail? Duncan asked. After a brief discussion, it was agreed that anyone interested in participating in such a subgroup will contact Dunlop at sdunlop@klohn.com. Schneider suggested that the upcoming conference, "Toward Ecosystem-Based Management" in Spokane might be a good time to convene the subcommittee.

7.3 Discussion: Are We, The Transboundary Gas Group, Making Effective Progress in Resolving the Transboundary Gas Issue?

As I said earlier, said Swain, much of the work we set out to do is now accomplished; the question now becomes, where do we go from here? Dan Miller asked the group to indulge in a few minutes of "navel-gazing" on this topic. Among the comments received:

- The information exchange role of the TGG is extremely useful (Duncan)
- Many of the structural and operational gas abatement activities that have been accomplished in the transboundary area would not have been accomplished without the efforts of the TGG (Swain)
- The group communicates well; there is a spirit of cooperation that permeates the TGG, and good communication is the foundation of its success (Irish)
- Next steps include further investigation of incentives for dissolved gas abatement,

continued information sharing and attempting to influence the various government entities that will make decisions about dissolved gas abatement (Maynard)

- No spill has occurred for almost a year, yet dissolved gas levels at the border are 106% today. In other words, there is very little wiggle room if the 110% standard is to be achieved. It would be helpful to have a better understanding of why TDG levels are so high even without spill (Klinge)
- The future direction of the TGG should be one of the first things discussed at the group's next meeting (Schneider).
- Overall, the TGG is doing a good job, and should continue to meet (general conclusion).

7.4 Conference Update.

Schneider distributed copies of the agenda for the technical session he will be chairing at the Spokane conference, "Toward Ecosystem-Based Management." He noted that the full schedule of events for the weeklong conference is available via the Sustainable Fisheries Foundation website.

8.0. Next TGG Meeting Date and Location.

The next meeting of the Transboundary Gas Group was set for October 22-23 in Vancouver, B.C.; it will be hosted by Dan Miller (Environment Canada). Meeting summary prepared by Jeff Kuechle, Bonneville Power Administration contractor.